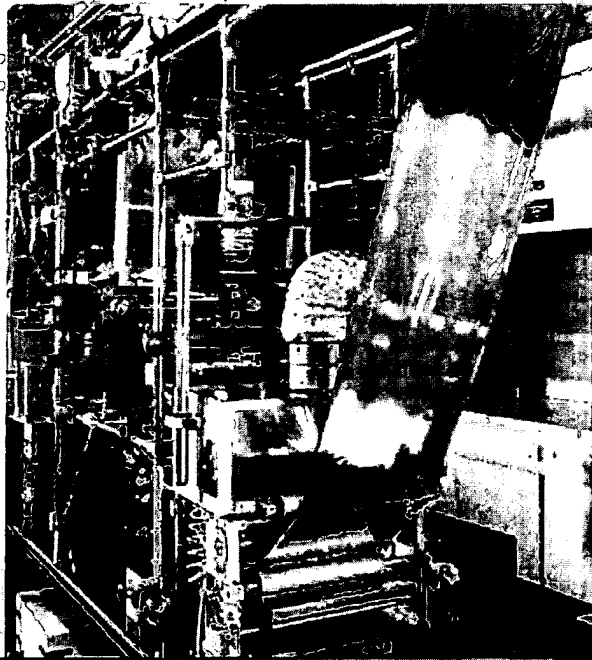


**ExxonMobil**  
*Chemical*

## Lamination



RK Print-Coat Laboratory Lamination and Printing Line,  
*European Technology Center*

RK Print-Coat Laboratory  
Lamination and Printing Line  
*European Technology Center*



**Technical specifications**

Gravure coating head (Industry standard for solvent-based adhesives)

Gravure offset coating head

Maximum web width

305 mm

Width of the applicator rolls

280 mm (gravure coating)  
265 mm (offset gravure coating)

Two air drying ovens

Heated lamination nip

Maximum line speed

20 m/min

One corona treating station

Inner diameter of the cores to be used

76 mm

*A peristaltic pump can supply the solvent-based adhesive to the coating head to allow production of longer reels with tight coating weight distribution.*

**Testing facilities**

**Test**

**> FILM CHARACTERIZATION**

Seal performance

Hot tack  
Seal initiation temperature  
Seal strength  
Seal through contamination

Adhesion strength

Barrier properties

Water vapor transmission rate (WVTR)  
Oxygen transmission rate (OTR)

**Conversion factors**

From mm to inch: multiply by 0.039370

From inch to mm: multiply by 25.40



## Testing facilities

### Mechanical properties

Tensile properties  
Puncture resistance  
Coefficient of friction (COF)  
Elmendorf tear

### Test

#### > GRADE (& FILM) CHARACTERIZATION

Odor & off-taste (Sensory evaluation)

### Form, Fill & Seal line

- > Form, Fill & Seal line
- Seal performance
- Seal integrity
- Packaging speed
- Sealing window

### Multi-layer film structures

The purpose of multi-layer film structures is property association of different components in order to optimize the packaging performance.

- > Polyethylenes: sealing performance & package integrity, consistent COF, mechanical properties and good organoleptics
- > Substrates: aluminum foil, (metallized) OPET, OPP, OPA
- Barrier: moisture, gas/oxygen, aroma and light barrier
- Packaging appeal: printing, stiffness

The three main processing categories for producing flexible multi-layer structures are:

- > Blown film or cast film co-extrusion
- > Extrusion coating, with either mono or co-extrusion coating
- > Lamination process



## Lamination

### VARIOUS LAMINATION TECHNOLOGIES

- > **Adhesive lamination**  
by means of an adhesive layer, applied onto one of the substrates prior to combination.
- > **Extrusion lamination**  
a molten polymer web (mostly polyethylene) serves as a tie layer.
- > **Thermal (or heat) lamination**  
by melting the adhesive layer(s), either by heated rollers or an (IR) heated oven prior to combination.

Adhesive and extrusion lamination are the most commonly used processes in today's packaging business.

- > **Main advantages**
  - flexibility to produce different structures (short runs)
  - possibility to use non-polymeric substrates
  - protection of printing against abrasion

### REQUIREMENTS FOR LAMINATION STRUCTURES

- > Good sealing performance: package integrity & high line speeds on packaging lines
- > Appropriate GCF and GCF consistency: smooth converting and packaging operations
- > Comply with food law or health-care requirements where applicable
- > High barrier properties: long shelf life of packed products
- > Good mechanical properties

### ADHESIVE LAMINATION

**Wet bonding:** the 2 webs are combined while the adhesive is still wet. This limits the process to applications in which one of the substrates is porous enough to allow the adhesive solvent to escape.

**Dry bonding** for non-porous substrates which can not be wet bonded

- > **Adhesives types**
  - polyurethane-based adhesives
  - polyether-based adhesives
  - polyester-based adhesives
  - polyether / polyester-based adhesives
  - acrylic adhesives

### Global Technical Centers

**Baton Rouge Technology Center**  
12875 Scenic Highway  
Baton Rouge, LA 70892-3006, USA  
Tel.: (225) 977-9285  
Fax: (225) 977-9689

**Baytown Polymers Center**  
5200 Bayway Drive  
Baytown, TX 77520, USA  
Tel.: (281) 834-5200  
Fax: (281) 834-2395

**European Technology Center**  
Hermeslaan 2  
B-1831 Machelen, Belgium  
Tel.: (32) 2 722 21 11  
Fax: (32) 2 722 27 80

**Sarnia Polymers Technology Center**  
480 Christina Street South  
P.O. Box 69  
Sarnia, Ontario, Canada N7T 7H8  
Tel.: (519) 339-4455  
Fax: (281) 339-2343

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